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Ms. Virginia Manoharan  
Examiner  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

August 26, 2005

Re: U.S. Patent Application Number 09/745,896  
Filed: December 21, 2000  
For: METHOD FOR PURIFICATION OF ACRYLIC ACID  
Applicant: Nippon Shokubai Co., Ltd.

Dear Ms. Manoharan:

Thank you for your call of Tuesday, August 23, 2005.

First, it is my understanding that you have requested, for scanning, certain documents including a European Search Report and a PTO-1449 form. I hope you will find what you need in the following documents which are being faxed with this letter:

- 1) Information Disclosure Statement dated February 17, 2003 (five pages);
- 2) EPO Communication and Search Report (three pages total);
- 3) unsigned PTO-1449 form (one page); and
- 4) Fax from the USPTO to the undersigned dated January 24, 2004 and consisting of Fax Cover Sheet and two signed PTO-1449 forms (three pages total).

Second, it is my understanding that you would like to know the basis for claims 16 and 17.

Claim 16 requires:  $3 \leq (\text{furfural concentration by weight})/(\text{acrolein concentration by weight}) \leq 100$ . Basis for such is found at:

- 1) page 6, lines 1-19 where the concentration ratio of furfural to acrolein being 100 or below is taught.
- 2) in Example 1 where the concentration ratio of furfural to acrolein is 3. Please see Table 1 on page 23 of the specification.
- 3) in Example 3 where the concentration ratio of furfural to acrolein is 25. Please see Table 1 on page 23 of the specification.
- 4) in Example 4 where the concentration ratio of furfural to acrolein is 75. Please see Table 1 on page 23 of the specification.

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August 26, 2005  
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Claim 17 requires:  $3 \leq (\text{furfural concentration by weight})/(\text{acrolein concentration by weight}) \leq 30$ . Basis for such is found at:

- 1) page 6, lines 6-19 where the concentration ratio of furfural to acrolein being between 2 and 30 (including the value 2 and 30) is taught.
- 2) in Example 1 where the concentration ratio of furfural to acrolein is 3. Please see Table 1 on page 23 of the specification.
- 3) in Example 3 where the concentration ratio of furfural to acrolein is 25. Please see Table 1 on page 23 of the specification.

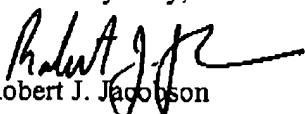
Third, it is my understanding that you would like to know the literal basis for claim 1. There is no paragraph in the specification having claim 1 in its present form. However, there is substantive basis for the literal form. As to step "a)" please see the above noted basis as to claim 16. As to step "b)," please see original claim 1 and original claim 7. As to step "c)," please see page 9, lines 17-23. As to step "d)," please see original claim 1. As to the use of "then" in claim 1, please see the specification as a whole, including the drawings.

To provide a literal basis in the specification, you may by Examiner's amendment add the following paragraph to the specification on page 26, between lines 16 and 17.

A present method for purification of acrylic acid includes the steps of a) providing a crude acrylic acid having a concentration ratio of furfural to acrolein by weight that is adjusted so as to satisfy the following equation:  $3 \leq (\text{furfural concentration by weight})/(\text{acrolein concentration by weight}) \leq 100$ ; then b) charging the crude acrylic acid with an aldehyde treatment chemical, with the aldehyde treatment chemical comprising a hydrazine compound; then c) reacting the hydrazine compound with aldehydes of the crude acrylic acid such that, after said step of reacting and prior to a step of distilling the crude acrylic acid, a concentration of said hydrazine compound in said crude acrylic acid is not more than 100 ppm by weight; and then d) distilling the crude acrylic acid containing said furfural and acrolein as impurities.

If there are remaining issues, please do not hesitate to call.

Yours very truly,

  
Robert J. Jacobson



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FAX -31 70 340 3016

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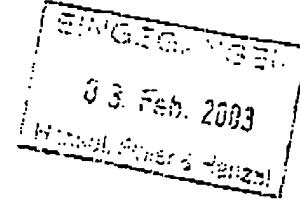
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Datum/Date  
04.02.03

Zeichen/Ref./Réf. 11102/CH/ajk	Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°. 00128183.1-2103-
Anmelder/Applicant/Demandeur/Patentinhaber/Propriétaire/Titulaire Nippon Shokubai Co., Ltd.	

## COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

The following specifications given by the applicant have been approved by the Search Division:

abstract

title

The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract: **NONE**



## REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.

European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 00 12 8183

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 759 358 A (UPMACIS RITA KARINA ET AL) 2 June 1998 (1998-06-02) * abstract * * column 4, line 60-65 * * column 5, line 31-40 * * example 2 * * table 4 * -----	1-4	C07C51/44 C07C51/487 C07C57/07
X	FR 2 753 445 A (ATOCHIM ELF SA) 20 March 1998 (1998-03-20) * page 11, line 8-31 * * page 15, line 21-25 * -----	1-4	
The present search report has been drawn up for all claims			
1	Place of search THE HAGUE	Date of completion of the search 22 January 2003	Examiner Delanghe, P
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : technological background N : non-written disclosure P : Intermediate document & member of the same patent family, corresponding document	
EPO FORM 1503 03 02 (Rev 01)			

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 00 12 8183

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-01-2003

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PTO/SB/08A (10-01)  
App. for use through 10/31/2002. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE  
U.S. GOVERNMENT PRINTING OFFICE: 2002 50-130-084  
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<p>Substitute for form 1449A/PTO</p> <p><b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b></p> <p><i>(use as many sheets as necessary)</i></p>				<p><b>Complete if Known</b></p>	
				<b>Application Number</b>	09/745,896
				<b>Filing Date</b>	December 21, 2000
				<b>First Named Inventor</b>	Yoshitake Ishii
				<b>Art Unit</b>	1764
				<b>Examiner Name</b>	
<b>Sheet</b>	1	<b>of</b>	1	<b>Attorney Docket Number</b>	2002-1411.QRI

## U.S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See *Kinds Codes of USPTO Patent Documents* at [www.uspto.gov](http://www.uspto.gov) or MPEP 801.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST 16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language Translation is attached.

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# Fax Cover Sheet

Date: 23 Jan 2004

To: Atty. Robert J. Jacobson	From: Virginia Manoharan
Application/Control Number: 09/745,896	Art Unit 1764
Fax No.: 612-539-6100	Phone No.: 571-272-1450
Voice No.: (651) 699-4008	Return Fax No.: 571-273-1450
Re: Form 1449	CC:
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## Comments:

Attached copies of PTO-1449 as per your request.

Number of pages 3 including this page

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## **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 1 of 1

**Complete If Known**

Application Number	OF EVEN DATE
Filing Date	OF EVEN DATE
First Named Inventor	Yoshitake ISHII
Group Art Unit	
Examiner Name	
Attorney Docket Number	00292

Socket Number 99292

U.S. PATENT DOCUMENTS

**FOREIGN PATENT DOCUMENTS**

**Examiner  
Signature**

V. Naraharan

Date \_\_\_\_\_  
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3. **Attached King of U.S. Patent Documents.** Enter Office that issued the document, by the two-letter code, and enter the serial number.

**1 Unique citation designation number.** **2 See Attached Kings of U.S. Patent Document.** **3** In the case of Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number.

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